

What is claimed is:

1. A composition comprising:
 - a) a sulfonated polyurethane polymer comprising the reaction product of:
 - 5 i) a polyisocyanate;
 - ii) a sulfonated polyol;
 - b) a second polymer formed from vinyl monomers; and
 - c) water;wherein the sulfonated polyurethane polymer comprises ethylenic
10 groups; and the composition has a VOC of less than about 5 % based on the total weight of the composition.
2. The composition of claim 1, wherein the polyurethane polymer further comprises a sulfonated polyol without ethylenic groups.
3. The composition of claim 1, wherein the polyurethane polymer further
15 comprises a sulfonated polyol with ethylenic groups.
4. The composition of any of claims 1-3, wherein the sulfonated polyol comprises an aliphatic or aromatic diacid having at least one sulfonate group.
5. The composition of any of claims 1-4, wherein the sulfonated diacid
20 comprises from about 3 to about 10 weight percent based on the weight of the polyurethane polymer.
6. The composition of claim 5, wherein the sulfonated diacid comprises from about 4 to about 8 weight percent based on the weight of the polyurethane polymer.

7. The composition of claim 6, wherein the sulfonated diacid comprises from about 5.5 to about 7.5 weight percent based on the weight of the polyurethane polymer.
8. The composition of any of claims 1-7, wherein the second polymer
5 comprises vinyl monomers selected from the group consisting of acrylic acid, methacrylic acid, methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, propyl methacrylate, butyl methacrylate, 2-ethylhexyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, 2-
10 (acetoacetoxy)ethylmethacrylate, acrylamide, methylacrylamide, diacetone acrylamide, styrene, α -methyl styrene, vinyl toluene, vinyl acetate, vinyl propionate, and mixtures thereof.
9. The composition of any of claims 1-8, wherein the second polymer
15 comprises vinyl monomers selected from the group consisting of acrylic acid, methacrylic acid, methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, propyl methacrylate, butyl methacrylate, 2-ethylhexyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate,
20 acrylamide, methylacrylamide, styrene, α -methyl styrene, vinyl toluene, vinyl acetate, vinyl propionate, and mixtures thereof.
10. The composition of claim 9, wherein the second polymer comprises methyl methacrylate, butyl acrylate, styrene, vinyl acetate, or a mixture thereof.
11. The composition of any of claims 8-10, wherein the second polymer is a
25 poly(meth)acrylate polymer.

12. The composition of claim 11, wherein, the poly(meth)acrylate polymer comprises a copolymer of an acrylate ester, methacrylate ester, acrylamide, methacrylamide, acrylic acid, methacrylic acid, or a mixture thereof.
- 5 13. The composition of claim 12, wherein the poly(meth)acrylate polymer comprises vinyl monomers selected from the group consisting of comprising methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, butyl methacrylate, and mixtures thereof.
- 10 14. The composition of any of claims 8-13, wherein the poly(meth)acrylate polymer comprises methyl methacrylate, butyl acrylate, or a mixture thereof.
- 15 15. The composition of claim 14, wherein the second polymer further comprises styrene, vinyl acetate, or a mixture thereof.
- 16 16. The composition of any of claims 1-15, wherein the second polymer is polymerized using a free radical catalyst.
17. The composition of any of claims 1-16, wherein the polyisocyanate is 1,2-ethylene diisocyanate, 1,4-tetramethylene diisocyanate, 1,6-hexamethylene diisocyanate, 2,2,4-trimethyl-1,6-hexamethylene diisocyanate, 2,4,4-trimethyl-1,6-hexamethylene diisocyanate, 1,12-dodecane diisocyanate, cyclobutane 1,3-diisocyanate, cyclohexane 1,3-diisocyanate, cyclohexane-1,4-diisocyanate, bis(4-isocyanatocyclohexyl)methane, 1-methylcyclohexane-2,2-diisocyanate, 1-methylcyclohexane-2,6-diisocyanate, 3-isocyanatomethyl-20 3,5,5-trimethyl-cyclohexyl isocyanate, 2,5-bis(isocyanatomethyl)-8-methyl-1,4,-methano-decahydronaphthalene, 3,5-bis(isocyanatomethyl)-25

- 8-methyl-1,4,-methano-decahydronaphthalene, 2,6-bis-(isocyanato)-4,7-methano-hexahydroindane, dicyclohexyl 2,4'-diisocyanate, dicyclohexyl 4,4'-diisocyanate, 2,6-hexahydrotolulene diisocyanate, 2,6-hexahydrotolulene diisocyanate, perhydro-2,4'-diphenylmethane diisocyanate, perhydro-4,4'-diphenylmethane diisocyanate, 1,3-phenylene diisocyanate, 1,4-phenylene diisocyanate, 4,4'-biphenyl diisocyanate, 4,4'-diisocyanato-3,3'-dimethoxybiphenyl, 4,4'-diisocyanato-3,3'-dimethylbiphenyl, 3,3'-diphenylbiphenyl-4,4'-diisocyanate, 2,4'-diphenylmethane diisocyanate, 4,4'-diphenylmethane diisocyanate, naphthylene 1,5-diisocyanate, 2,4-toluene diisocyanate, 2,6- toluene diisocyanate, N,N'-(4,4'-dimethyl-3,3'-diisocyanato-diphenyl)uretdione, m-xylylene diisocyanate, tetramethylxylene diisocyanate, 2,4,4'-triisocyanatodiphenyl ether, 4,4',4''-triisocyanatotriphenylmethane, tris (4-isocyanatophenyl) thiophosphate, or a mixture thereof.
18. The composition of claim 17, wherein the polyisocyanate is a diisocyanate.
19. The composition of claim 18, wherein the diisocyanate is 2,4- toluene diisocyanate, 2,6- toluene diisocyanate, 1,6-hexamethylene diisocyanate, 2,4'-disocyanato-diphenylmethane, 4,4'-disocyanato-diphenylmethane, 4,4'-diphenylmethane diisocyanate, 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate, bis(4-isocyanatocyclohexyl)methane, dicyclohexyl 2,4'-diisocyanate, dicyclohexyl 4,4'-diisocyanate, or a mixture thereof.
20. The composition of any of claims 1-19, wherein the sulfonated polyol comprises a polyester, an alkyd or a mixture thereof.
21. The composition of any of claims 4-20, wherein the sulfonate groups are present in the form of ammonium, tertiary amine, calcium, copper, or iron salts.

22. The composition of any of claims 4-20, wherein the sulfonate groups are present in the form of alkali metal salts.
23. The composition of claim 22, wherein the alkali metal salts are lithium, sodium or potassium.
- 5 24. The composition of any of claims 1-23, wherein the sulfonated polymer comprises a derivative of 5-sulfo-isophthalic acid.
25. The composition of any of claims 1-24, wherein the polyurethane polymer further comprises a chain extension agent.
- 10 26. The composition of claim 25, wherein the chain extension agent is an alkyl amino alcohol, cycloalkyl amino alcohol, heterocyclic amino alcohol, polyamine, hydrazine, substituted hydrazine, hydrazide, amide, water or a mixture thereof.
- 15 27. The composition of claim 25 wherein the chain extension agent comprises ethylene diamine, diethylene triamine, triethylene tetra amine, melamine or a mixture thereof.
28. The composition of claim 25, wherein the chain extension agent comprises ethylene diamine.
29. The composition of claim 25, wherein the chain extension agent comprises polyalkene oxide, a hydroxyl functional latex or amine functional latex.
- 20 30. The composition of any of claims 1-29, wherein the composition has a VOC less than about 3 percent, based on the total weight of the composition.
- 25 31. The composition of claim 30, wherein the VOC is less than about 1 percent, based on the total weight of the composition.

32. The composition of claim 31, wherein the VOC is substantially zero percent, based on the total weight of the composition.
33. A process for preparing a water dispersible polyurethane - polyethylene polymer composition of any of claims 1-32 comprising;
- 5 a) blending a polyurethane prepolymer with one or more vinyl monomers, inert to isocyanate functionality;
- b) dispersing the prepolymer/vinyl monomer blend into water;
- c) chain extending the terminal isocyanate groups of the prepolymer with one or more active hydrogen containing compounds wherein
- 10 the chain extended polyurethane prepolymer has
- i) at least one sulfonate group and at least one curable ethylenic unsaturated group; and
- ii) terminal isocyanate groups or both terminal isocyanate groups and terminal vinyl groups; and
- 15 d) reacting the vinyl monomers by free radical polymerization.